

Transaction Cost Economics (TCE) and Cost Estimation Methodology

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SYMPOSIUM, PANEL 17

15 MAY 2008

Report Documentation Page			<i>Form Approved OMB No. 0704-0188</i>		
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1. REPORT DATE 15 MAY 2008	2. REPORT TYPE	3. DATES COVERED 00-00-2008 to 00-00-2008			
4. TITLE AND SUBTITLE Transaction Cost Economics (TCE) and Cost Estimation Methodology		5a. CONTRACT NUMBER			
		5b. GRANT NUMBER			
		5c. PROGRAM ELEMENT NUMBER			
6. AUTHOR(S)		5d. PROJECT NUMBER			
		5e. TASK NUMBER			
		5f. WORK UNIT NUMBER			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School, Defense Resources Management Institute (DRMI), Monterey, CA, 93943		8. PERFORMING ORGANIZATION REPORT NUMBER			
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)			
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)			
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES 5th Annual Acquisition Research Symposium: Creating Synergy for Informed Change, May 14-15, 2008 in Monterey, CA					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 25	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

OUTLINE

- OVERVIEW: TCE AND COSTS
- FINDING TRANSACTION COSTS IN DOD PROGRAMS
(Diana Angelis)
- WHAT'S NEXT?

OVERVIEW

- ENTERING HYPOTHESIS
- TRANSACTION COST ECONOMICS (TCE)
 - MAKE OR BUY, AND ASSOCIATED DIFFICULTIES
- OUR VIEW OF TCE AND COST ESTIMATION

ENTERING HYPOTHESIS

- ...namely cost drivers are more complex than current methodology considers.
- Cost = $f(\text{"Production" Costs}, \text{Transaction Costs})$
 - Production Costs = $g(\text{WBS, systems integration})$
 - Transaction Costs = Coordination and Motivation Costs
- Can a more complete view of costs improve cost estimation methodology?

Transaction Cost Economics

- STUDY OF “VERTICAL” FIRM BOUNDARIES
- KEY PARTS OF WORLD VIEW
 - MARKETPLACE IS NOT A FRICTIONLESS, COSTLESS MEDIUM
 - ENTERPRISES ARE A NETWORK OF CONTRACTUAL RELATIONSHIPS (TRANSACTIONS)
 - THE NATURE OF THE TRANSACTIONS DETERMINES THE VERTICAL BOUNDARIES (INDICATES WHETHER TO MAKE OR BUY)
- A WELL-DEVELOPED FIELD OF STUDY

BASIC RULE FOR MAKE-OR-BUY DECISION

- BUY (OUTSOURCE) IF
INTERNAL COSTS > OUTSOURCED COSTS
- INTERNAL COSTS = PRODUCTION COSTS + “AGENCY” COSTS
- OUTSOURCED COSTS = PRODUCTION COSTS + “TRANSACTION” COSTS

STARTING POINTS

- AGENCY THEORY (including the Principal-Agent Problem)
- TRANSACTIONS COST ECONOMICS (TCE)
 - “VERTICAL” BOUNDARIES OF THE FIRM: what to produce *within firm boundaries*.
- COMPETITIVE SOURCING, e.g., A-76

THE PROMISE OF OUTSOURCING

- LOWER PRODUCTION COSTS IN THE GENERAL MARKETPLACE
 - COMPETITIVE FIRMS ARE HIGHLY EFFICIENT
 - ... AND PASS THOSE RESULTS ON TO THEIR CUSTOMERS ($P \approx MC$)
- LESSENING “AGENCY” COSTS
 - REMINDER OF CONTESTABILITY

THE FUNDAMENTAL TRANSFORMATION

- SOME OUTSOURCING RELATIONSHIPS LEAVE THE COMPETITIVE MARKETPLACE
- IN PARTICULAR, RELATION-SPECIFIC INVESTMENTS REMOVE ALTERNATIVE TRADING PARTNERS
 - STARTING WITH COMPETITIVE BIDDING CAN LEAD TO BILATERAL MONOPOLY AS A RESULT

TCE AND THE PERILS OF OURSOURCING

- TRANSACTIONS COSTS ARISE FROM VARIOUS SOURCES
 - COORDINATING ACTIVITIES
 - SAFEGUARDING SENSITIVE INFORMATION
 - MOTIVATING EFFORTS FOR MUTUAL INTEREST
- RISKS TO BOTH PARTIES OF THE RELATIONSHIP

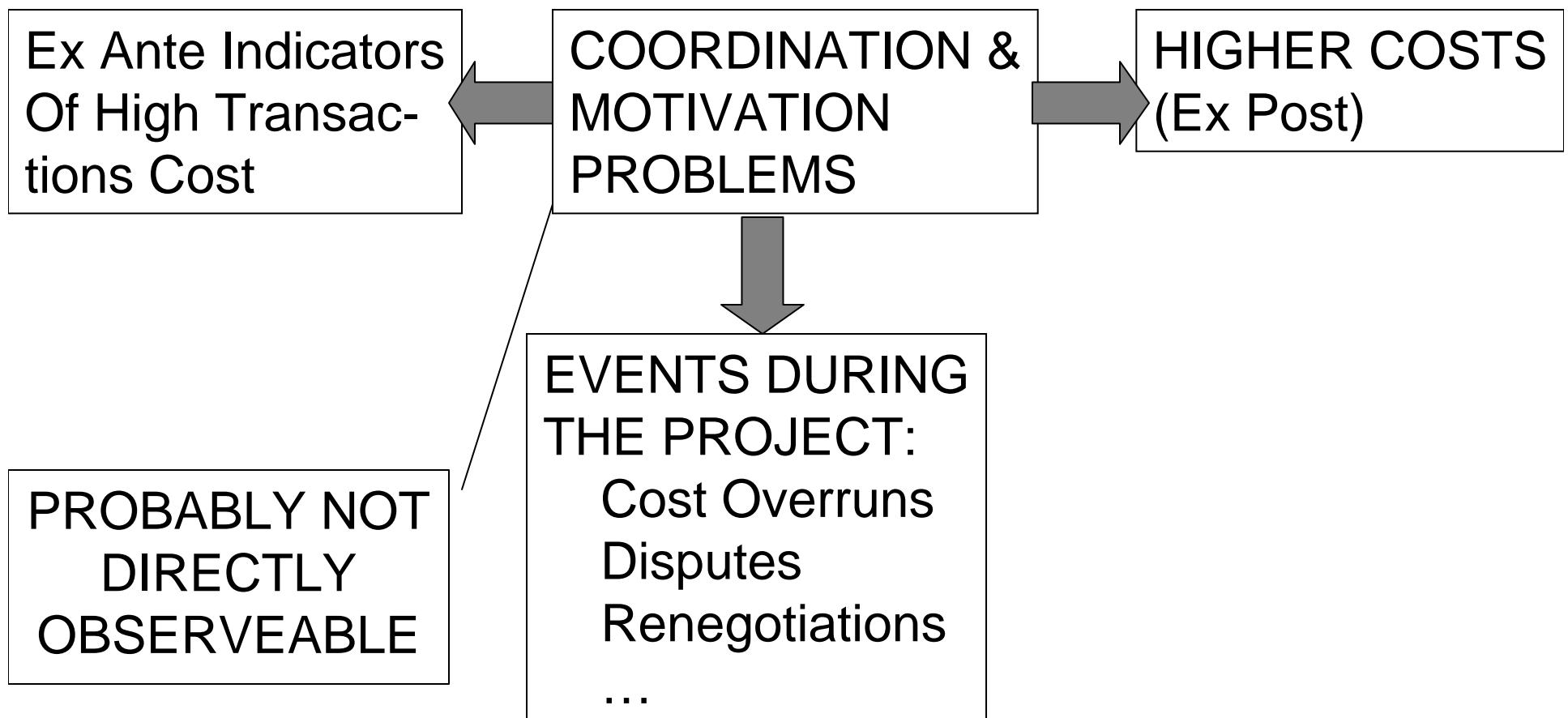
MOTIVATION: Avoiding Opportunistic Behavior & Hold Up

- OPPORTUNISTIC BEHAVIOR: “Self-interest seeking with guile ...” (Williamson)
 - Also defined as unproductive bargaining or “rent-seeking” activities.
- HOLDUP: being forced to accept worse terms through renegotiation with a partner who threatens to terminate the relationship.
- Bilateral bargaining can dissipate or even eliminate any gains from a transaction.

ADDRESSING THE HOLDUP PROBLEM: Benefits & Costs

- WELL-CRAFTED CONTRACTS
 - INCENTIVES
 - ENFORCEMENT
 - “GOVERNANCE” PROVISIONS
- “TAPERED” INTEGRATION
 - STANDBY CAPACITY
 - “GOCO” PHYSICAL ASSETS
- COSTLY ACTIONS WHICH DISSIPATE GAINS, BUT STILL LEAVE SOME (ALBEIT LESSENED) RISKS

TCE ISSUES IN ACQUISITION PROJECTS AND HYPOTHEZIZED MANIFESTATIONS



EX ANTE INDICATORS OF TRANSACTIONS COSTS

“STOPLIGHT METHOD”

- ASSET SPECIFICITY
 - **RED:** ONE QUALIFIED SUPPLIER
 - **GREEN:** MANY AVAILABLE SUPPLIERS
- COMPLEXITY
 - **RED:** LARGE SCALE, SPECIALIZED SKILLS
 - **GREEN:** ROUTINE TASK OR STANDARD PRODUCT

EX ANTE INDICATORS II

- LENGTH OF RELATIONSHIP
 - **RED:** LONG-TERM, HARD TO FORESEE PROBLEMS
 - **GREEN:** SERIES OF SEPARATE TRANSACTIONS
- FREQUENCY
 - **RED:** SPECIALIZED TASK WITH SIGNIFICANT LEARNING BY DOING
 - **GREEN:** ROUTINE, STANDARD TASK. WIDESPREAD LEARNING BY DOING

EX ANTE INDICATORS III

- TIME SENSITIVITY
 - RED: TIMELY, SHORT-FUSED PERFORMANCE HIGHLY IMPORTANT
 - GREEN: NON-TIMELY PERFORMANCE CAUSES INCONVENIENCE
- OPERATIONAL SIGNIFICANCE
 - RED: UNSATISFACTORY PERFORMANCE DEGRADES READINESS OR SAFETY
 - GREEN: UNSATISFACTORY PERFORMANCE CAUSES INCONVENIENCE

Getting Good Data: A Tale of (mostly) Frustration

- ***HOW TO MEASURE TRANSACTION COSTS? (or what would be a good proxy?)***
 - Program Management Office (PMO) costs
 - Program Management (Contract) costs

Data for Major Acquisition Programs

- Consolidated Acquisition Reporting System (CARS)
 - Includes information from Selected Acquisition Reports (SAR) and Defense Acquisition Executive Summaries (DAES)
- Budget Item Justification sheets
 - OSD budget
- Cost Data Summary Report (DD 1921)
 - Contract WBS elements

Problems with Existing Data I

- SAR and DAES do not contain the level of detail necessary to identify PMO costs
- OSD budget is not consistent in reporting PMO costs across programs and years
- Information in CARS does not always track to OSD budget
 - SAR only includes the six largest active contracts

Problems with Existing Data II

- CDSR (1921) categories are not consistent across programs or contractors
 - Program Management (non-ILS)
 - Program Management (ILS)
 - System Engineering & Program Management (SEMP)
 - System Engineering (Management)
 - Program Management
- Difficult to compare across programs

Case Studies

Indicators

ATACMS

Ex Ante: 1 Red,
 2 Yellow
 2 Green

Progress

- Consistently on schedule, on budget
- No major issues

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Ex Ante: 1 Red,
 4 Yellow

Progress

- Nunn-McCurdy breach, behind schedule
- Governance issues: renegotiation (cost sharing), “rebaselined”²¹

Case Studies

Cost

ATACMS

Ex Post:

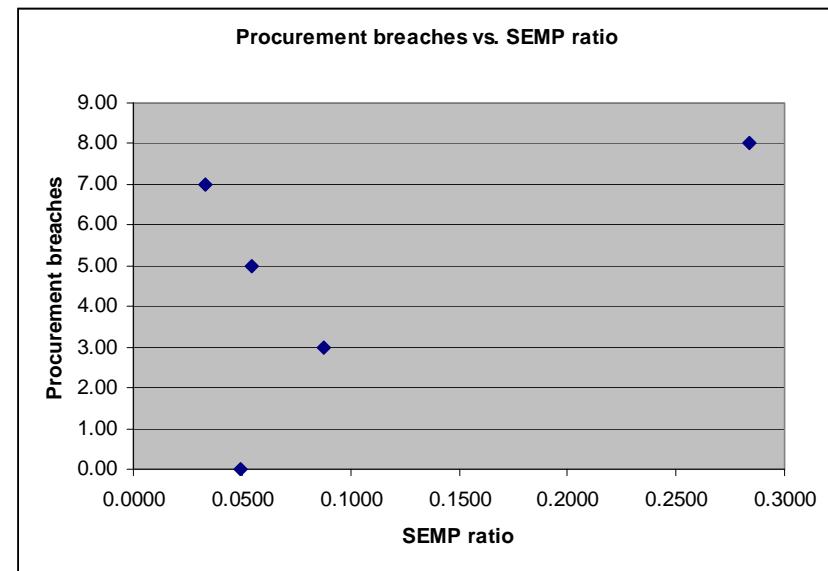
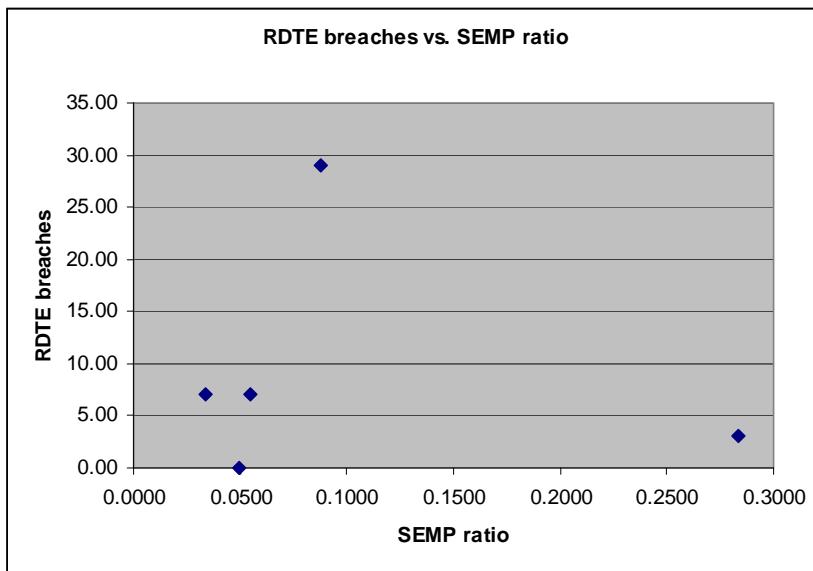
- One source
- 9 CDSRs
 - Most FFP
- SEMP/Total Ratio
 - **0.0858**

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Ex Post:

- Two or three sources
- 20 CDSRs
 - Most CP
- SEMP/Total Ratio
 - **0.1629**

Notional Analysis



WHAT DATA WOULD WE COLLECT FOR TRANSACTION COSTS?

- MORE STANDARDIZED MEASUREMENT OF TRANSACTION-COST AVOIDANCE MEASURES
- CONTRACT NEGOTIATION AND ADJUDICATION
- TAPERED INTEGRATION
- MONITORING EFFORTS – INCLUDING DT&E

WHAT'S NEXT?

- ADD TO BODY OF CASE STUDIES
 - FOCUS ON *EX ANTE* INDICATORS AND PROGRAM HISTORY VS. *EX POST* COST, SCHEDULE OR PERFORMANCE SHORTCOMINGS
- CONTINUE EXAMINING SEMP RATIO AS INDICATOR OF TRANSACTION COSTS
- RUN A PROTOTYPE CALCULATION OF TRANSACTIONS COST FOR ONE PROGRAM